

**OAK RIDGE NATIONAL LABORATORY  
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**ORNL  
FOREIGN TRIP REPORT  
TA 423377**

**DATE:** 12/04/2018

**SUBJECT:** Foreign Trip Report for Douglas G. Bowen travel to AWE (UK), IRSN (FR), and JRC (BE) to execute meetings for the DOE/NNSA Nuclear Criticality Safety Program (NCSP)

**TO:** Angela Chambers, Nuclear Criticality Safety Program Manager, National Nuclear Security Administration / NA-511/GTN, Pantex Plant, PO Box 30020, Amarillo, TX 79120-0020

**FROM:** Douglas G. Bowen, Ph.D.  
Nuclear Criticality Safety Program Execution Manager  
Group Leader of the Nuclear Data and Criticality Safety Group, Oak Ridge National Laboratory (ORNL)

**MEETING:  
TITLE** DOE/NNSA NCSP Meetings with AWE, IRSN, and JRC-Geel to Enhance International Collaborations

**MEETING:  
LOCATION** 5/31-6/1 – AWE, Reading, UK; 6/4-6/5 – IRSN, Paris, FR; and 6/7-6/8 – JRC-Geel, Belgium

**MEETING:  
DATES** 05/29/18 – 06/09/18

**ATTENDEES:  
ON BEHALF OF  
NCSP** Douglas G. Bowen

**MEETING:  
BENEFIT TO  
NCSP** This meeting was to travel with the NCSP Manager, Dr. Angela Chambers, NNSA NA-511, to visit the sites of our international collaborators, Atomic Weapons Establishment (AWE) in Reading, UK, L'Institut de Radioprotection et de Sûreté Nucléaire (IRSN) in Paris, France, and the European Commission's Joint Research Centre (JRC) Geelina Accelerator in Geel, Belgium. The benefit to the NCSP is to enhance and expand international collaborations with these institutions.

**MEETING  
PURPOSE:** The purpose of the travel to expand and enhance our international collaborations with AWE, IRSN, and JRC-Geel. An agenda for the trip is attached to this trip report.

**SITES VISITED:**    **AWE, Reading, UK, IRSN, Paris, France, and JRC GELINA Facility, Geel, Belgium.**

**ABSTRACT:**        Dr. Douglas G. Bowen and Dr. Angela Chambers traveled to AWE, IRSN, and JRC-Geel to discuss the NCSP Mission and Vision document and collaborative tasks for the annual 5-year planning process. AWE and IRSN have both been collaborating with the NCSP for years. Discussions about additional collaborative activities in training and education, nuclear data, and other NCSP technical program elements were discussed. The meetings at JRC-Geel were particularly important because the European Union wanted to formalize NCSP collaborations via a new collaboration agreement with ORNL or NNSA. After some good discussion, the NCSP and JRC-Geel will have a collaboration agreement via NA-24 to continue the NCSP Nuclear Data program for years to come. The NCSP meetings with JRC-Geel staff also focused on implications of DOE/SC-Nuclear Physics policies at the ORNL National Isotope Development Center (NIDC) that have precluded economical isotope leases for neutron scattering measurements. An action was taken to discuss this issue with DOE/SC-NP after returning from this trip.

## **DISTRIBUTION**

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2. Angela Chambers ([angela.chambers@nnsa.doe.gov](mailto:angela.chambers@nnsa.doe.gov))
3. Lori Scott ([Lorisc0tt@aol.com](mailto:Lorisc0tt@aol.com))

# NCSP AWE/IRSN/JRC Trip

May 29-June 9, 2018

Day #	Date	Bowen's Arrangements	Chambers' Arrangements	Meeting Start	Meeting End
1	29-May TUESDAY	Travel Day		–	–
		US to London Heathrow International Airport		–	–
		Flights – Delta DL 4824 TYS-DTW Departs 5:15pm, DL 18 DTW-LHR Arrives 11:10am	Angela - United UA4066 - AMA- IAH Departs 5:00 PM, UA5 - IAH - LHR Arrives 11:35 AM May 30	–	–
		No hotel		–	–
2	30-May WEDNESDAY	Rest Day		–	–
		Reading, UK		–	–
		Travel via bus or taxi from airport to hotel		–	–
		Hotel – Crowne Plaza Reading – Caversham Bridge, Richfield Avenue, Reading RG1 8BD, United Kingdom Phone: +44 118 925 9988	Hotel – Hilton Reading, Drake Way, Reading RG2 0GQ, United Kingdom Phone: +44 118 916 9000	–	–
3	31-May THURSDAY	AWE		8:30 AM	5:15 PM (+dinner 7:00)
		Reading, UK		–	–
		Travel to AWE site from hotel: Ask AWE to pick us up or take taxi to facility		–	–
		Hotel – Crowne Plaza Reading – Caversham Bridge, Richfield Avenue, Reading RG1 8BD, United Kingdom Phone: +44 118 925 9988	Hotel – Hilton Reading, Drake Way, Reading RG2 0GQ, United Kingdom Phone: +44 118 916 9000	–	–
4	1-Jun FRIDAY	AWE		No meetings – AWE OFF	
		Reading, UK		–	–
		Set up meeting location for this day - AWE facilities will be closed		–	–
		Hotel – St. Pancras Renaissance London Hotel – Euston Rd, Kings Cross, London NW1 2AR, UK Phone: +44 20 7841 3540	Hotel – Hilton London Angel Islington, 53 UPPER STREET, LONDON, N1 0UY, UNITED KINGDOM Phone: +44-207-3547700	–	–
5	2-Jun SATURDAY	Personal Time		–	–
		London, UK		–	–
		No travel		–	–
		Hotel – St. Pancras Renaissance London Hotel – Euston Rd, Kings Cross, London NW1 2AR, UK Phone: +44 20 7841 3540	Hotel – Hilton London Angel Islington, 53 UPPER STREET, LONDON, N1 0UY, UNITED KINGDOM Phone: +44-207-3547700"	–	–
6	3-Jun SUNDAY	Travel Day		–	–
		Travel from London, UK, to Paris, FR. (2.5 hours)		–	–
		Eurostar train – <a href="https://www.eurostar.com/us-en/?">https://www.eurostar.com/us-en/?</a> . London station is: London St. Pancras International. Paris station is Paris Gare du Nord. Coach 4 Seats: 65 and 66.	Coach 11 Seats: 77, 78, 83 and 84.	–	–
		Hotel - Paris Marriott Rive Gauche Hotel & Conference Center – 17 Boulevard Saint-Jacques, 75014 Paris, France Phone: +33 1 40 78 79 80	Same hotel	–	–
7	4-Jun MONDAY	IRSN		–	–
		Paris, FR		–	–
		Taxi, bus, subway to IRSN. Ask if Luiz or others can meet us at hotel.		–	–
		Hotel - Paris Marriott Rive Gauche Hotel & Conference Center – 17 Boulevard Saint-Jacques, 75014 Paris, France Phone: +33 1 40 78 79 80	Same hotel	–	–
8	5-Jun TUESDAY	IRSN		–	–
		Paris, FR		–	–
		Taxi, bus, subway to IRSN. Ask if Luiz or others can meet us at hotel.		–	–
		Hotel - Paris Marriott Rive Gauche Hotel & Conference Center – 17 Boulevard Saint-Jacques, 75014 Paris, France Phone: +33 1 40 78 79 80	Same hotel	–	–
9	6-Jun WEDNESDAY	Travel Day		–	–
		Paris, FR, to Geel or Brussels, Belgium		–	–
		Rail Europe –Stations: Paris Gare du Nord (from) - Brussels Midi/Zuid (to): 11:25 AM - 12:47 PM; Coach 5, Seat 51 & 52	11:25 AM - 12:47 PM	–	–
		Hotel - Pullman Brussels Centre Midi Address: Place Victor Horta 1, 1060 Bruxelles, Belgium Phone: +32 2 528 98 00	Hotel – Hilton Garden Inn Brussels Louise, Berckmansstraat 128, Brussels, 1060, Belgium Phone: +32-2-5388830	–	–
10	7-Jun THURSDAY	JRC/GELINA		9:00 AM	5:00 PM
		Geel, Belgium		–	–
		No Travel		–	–
		Hotel – Pullman Brussels Centre Midi Address: Place Victor Horta 1, 1060 Bruxelles, Belgium Phone: +32 2 528 98 00	Hotel – Hilton Garden Inn Brussels Louise, Berckmansstraat 128, Brussels, 1060, Belgium Phone: +32-2-5388830 "	The train station that we will use to arrive in Brussels is the same as the station for	

11	8-Jun	JRC/GELINA		9:00 AM	4:00 PM
		Geel, Belgium		—	—
		No Travel		—	—
	FRIDAY	Hotel – Pullman Brussels Centre Midi Address: Place Victor Horta 1, 1060 Bruxelles, Belgium Phone: +32 2 528 98 00	Hotel – Hilton Garden Inn Brussels Louise, Berckmansstraat 128, Brussels, 1060, Belgium Phone: +32-2-5388830 "	The train station that we will use to arrive in Brussels is the same as the station for	

12	9-Jun	Travel Day		—	—
		Brussels, Belgium to US		—	—
	SATURDAY	Flights – DL81 BRU-ATL Departs 11:05am, DL 3315 ATL-TYS Arrives 6:50pm	Flights – United UA973 BRU - ORD departs 11:00 AM UA1128 ORD - IAH departs 2:12 PM UA4023 IAH - AMA arrives 8:15 PM	—	—
		No hotel		—	—



# AWE/NCSP Meeting Agenda

May 31, 2018



Time	Agenda Topic	Individual/ Organisation
<b>Thursday, 31<sup>st</sup> May 2018 – Gemini meeting room (TBC)</b>		
08:30	Meet at Pass Office for site access	Leo Clark/Richard Jones, AWE
08:45	Walk to Gemini	Leo Clark/Richard Jones, AWE
9:00	Welcome and Introductions; Outline the purpose of visit	Angela Chambers, NCSP Andrew Randewich, AWE
9:20	Overview discussion; NCSP program mission/vision  AWE collaborations	Angela Chambers, NSPC Chris Wilson, AWE Neil McMillian, AWE Richard Jones, AWE Emily Cornock, AWE
10:00	Discussion on areas to strengthen and enhance collaborations between AWE/NCSP	All
10:30	<b>Coffee Break</b>	
10:45	Discussion about NCSP/AWE collaborative tasks from the 5 year plan <ul style="list-style-type: none"> <li>• Discussion/Summary Tasks from the <b>FY18</b> NCSP 5 year plan (Appendix F – see attached table)</li> <li>• Generation of the collaboration table for the NCSP <b>FY19</b> 5-year plan (Appendix F)</li> </ul>	All
12:15	<b>Buffet lunch (working)</b>	
12:15	Discussion of specific projects of interest (Open tasks) <ul style="list-style-type: none"> <li>• (See attached table from FY18 5 year plan)</li> <li>• Training and education topics</li> <li>• JOWOG 30-23-00 criticality safety topics of discussion</li> <li>• Other topics of interest</li> </ul>	All
13:15	Travel to PTC	TBC
13:30	Tour of AWE PTC	TBC
16:00	Travel to alternate meeting location (TBC)	TBC
16:15	General Discussion/ Wrap up	TBC
17:15	Return to main gate	Leo Clark/Richard Jones, AWE
19:00	Evening meal + further discussion?	

Time Required	Agenda Topic	Responsible Org/Person
<b>Monday, June 4, 2018</b>		
9:00-9:30	Welcome and introductions <ul style="list-style-type: none"> <li>Discussion about the purpose of the visit</li> </ul>	IRSN/NCSP
9:30-10:30	Status of collaborative work <ul style="list-style-type: none"> <li>IRSN collaboration overview presentation</li> <li>NCSP overview presentation</li> </ul>	EVO CHAMBERS
10:30-12:15	Discussion of FY18 NCSP/IRSN Collaborative Tasks (see the attached table, "accident dosimetry" tasks will be discussed on Tuesday) <ul style="list-style-type: none"> <li>IRSN to present summary slides for each task in FY18 NCSP 5-year plan <ul style="list-style-type: none"> <li>IRSN drivers for collaboration</li> </ul> </li> <li>NCSP to present summary slides for FY18 tasks <ul style="list-style-type: none"> <li>NCSP drivers for the task</li> </ul> </li> </ul>	IRSN  BOWEN
	Lunch	
14:00-15:30	Generation of Collaboration Table for the FY19 NCSP 5-year Plan (Appendix E)	All
15:30-16:30	Visit of the Emergency Response Center	IRSN
16:30-16:45	Visit to the General Director	IRSN
16:45-17:30	Presentation of the INSIDER and PRINCESS projects	IRSN
<b>Tuesday, June 5, 2018</b>		
9:00-10:00	General discussion/New Topics <ul style="list-style-type: none"> <li>Training and Education/Nuclear Data <ul style="list-style-type: none"> <li>AMPX workshop at IRSN (ORNL support)</li> </ul> </li> </ul>	All
10:00-11:15	Discussion of FY18 NCSP/IRSN Collaborative Tasks (see the attached table, "accident dosimetry" tasks only) <ul style="list-style-type: none"> <li>IRSN to present summary slides for each task in FY18 NCSP 5-year plan <ul style="list-style-type: none"> <li>IRSN drivers for collaboration</li> </ul> </li> <li>NCSP to present summary slides for FY18 tasks <ul style="list-style-type: none"> <li>NCSP drivers for the task</li> </ul> </li> </ul>	IRSN  BOWEN
11:15-12:15	Tour of the Nuclear Accident Dosimetry Laboratory	IRSN
	Lunch	
14:00-16:00	Collaborations of current NCSP and IRSN Nuclear Data measurements and evaluations (ORNL SNS, RPI, GELINA, N_TOF) <ul style="list-style-type: none"> <li>ORNL/IRSN collaboration</li> <li>SNS, RPI, GELINA measurements</li> </ul>	All
16:00-17:00	<b>Final Discussion</b>	

Time	Agenda Topic	Responsible Org/Person
<b>Thursday, June 7, 2018</b>		
09H30 – 10H00	Welcome and introductions <ul style="list-style-type: none"> <li>• Discussion about the purpose of the visit</li> </ul>	JRC/NCSP
10H00 – 12H00	Overview of the NCSP program: <ul style="list-style-type: none"> <li>• Data needs for the NCSP</li> <li>• Experimental facilities for Nuclear data measurements <ul style="list-style-type: none"> <li>○ Geel</li> <li>○ RPI</li> <li>○ Others</li> </ul> </li> <li>• Evaluations of the data</li> <li>• Data processing and testing</li> <li>• Critical Experiments</li> <li>• Collaborations</li> <li>• Education</li> </ul>	D. Bowen A. Chambers
12H00 – 13H30	Lunch	
13H30 – 15H00	Overview of the JRC-Geel nuclear data activities <ul style="list-style-type: none"> <li>• Facility</li> <li>• Experimental capabilities</li> <li>• Nuclear data work</li> <li>• Support to IAEA and WPEC</li> <li>• Collaborations</li> </ul>	A. Plompen (or J. Heyse)
15H00 – 17H00	Status of Y12 NCSP target fabrication for JRC/GELINA and ORELA Target Shipment	All
<b>Friday, June 8, 2018</b>		
09H30 – 11H00	Future of the JRC-NCSP collaboration and how could be established within the EU-DOE work plan.	D. Bowen A. Chambers
11H00 – 12H00	Visit of MONNET and experimental capabilities. Possible use for the NCSP and NDA nuclear data needs.	P. Siegler
12H00 – 13H30	Lunch	
14h00 – 15H00	Tour of the GELINA facility and TOF stations	J. Heyse
15H00 – 16H00	Final Discussion	All